

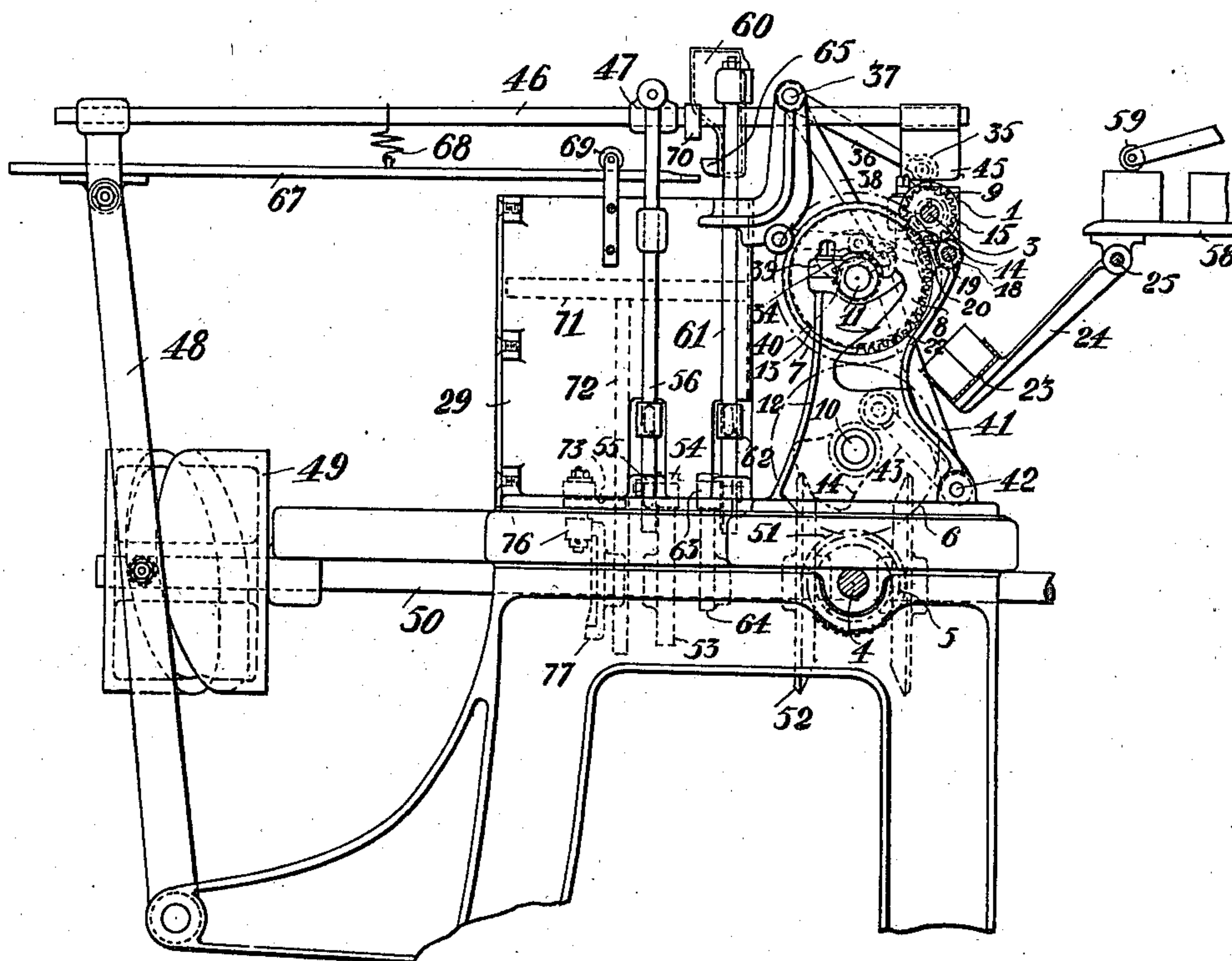
C. S. NYBERG.
PACKETING MACHINE.
APPLICATION FILED MAR. 5, 1909

965,317.

Patented July 26, 1910.

3 SHEETS—SHEET 1.

Fig. 1



Witnesses:-
Larissa French
Samuel Hallgren

Inventor:-
Carl Sigfrid Nyberg
by *Almond*
his Attorney

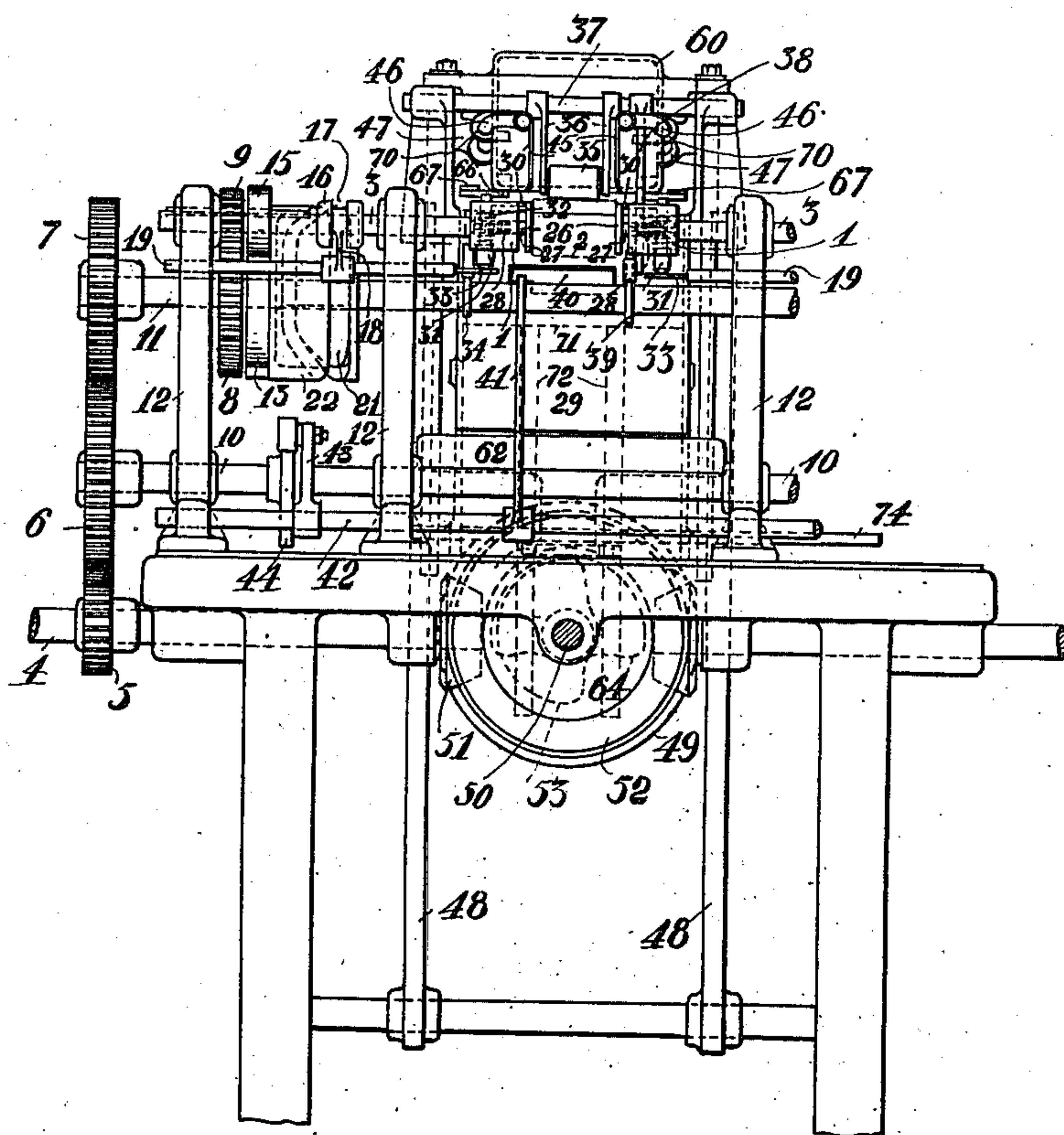
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3 SHEETS—SHEET 2.

Fig. 2



Witnesses—

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C. S. NYBERG.

PACKETING MACHINE.

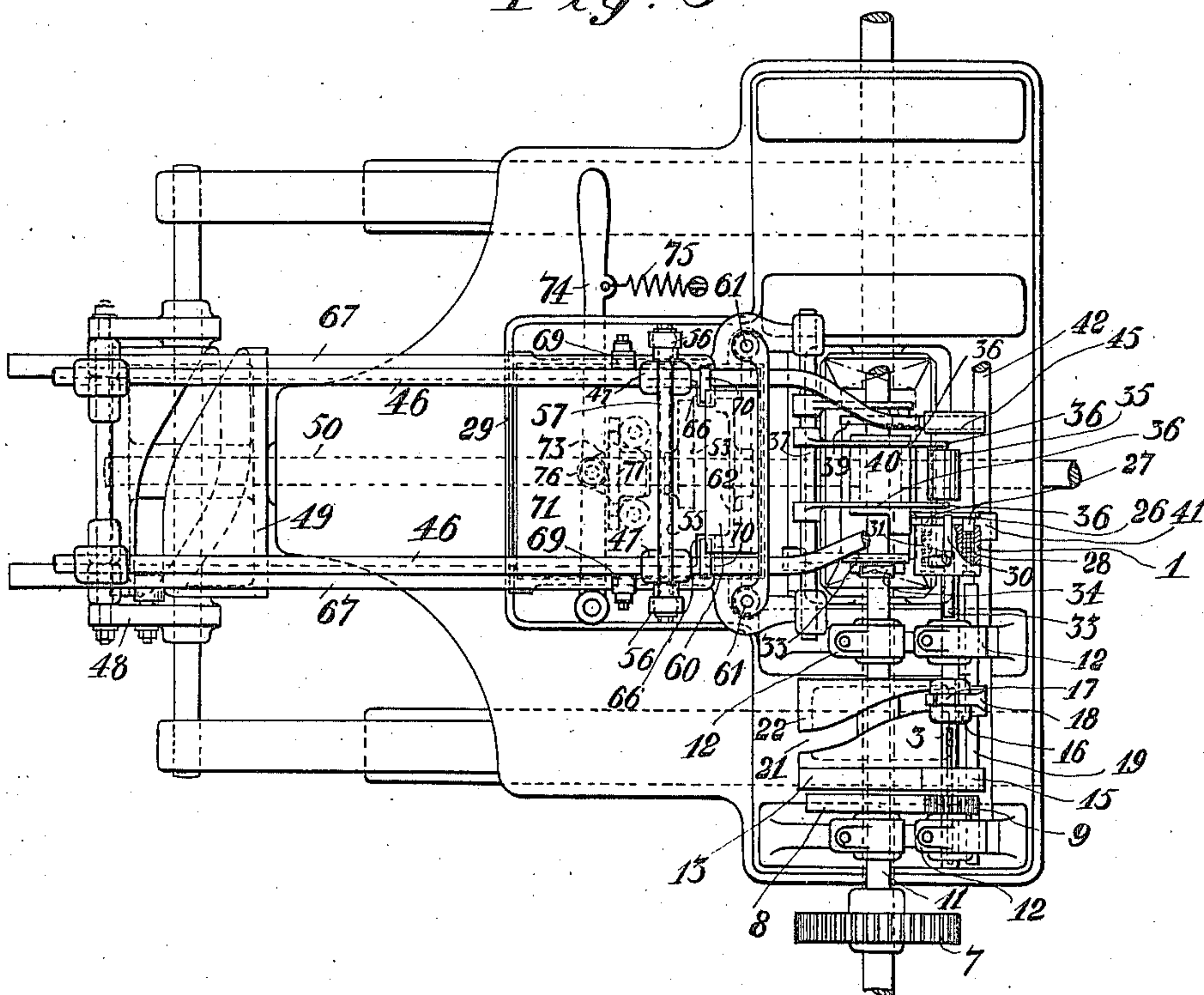
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965,317.

Patented July 26, 1910.

3 SHEETS—SHEET 3.

Fig. 3



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UNITED STATES PATENT OFFICE.

CARL SIGFRID NYBERG, OF MARIEDAL, SÖDERTELJE, SWEDEN.

PACKETING-MACHINE.

965,317.

Specification of Letters Patent.

Patented July 26, 1910.

Application filed March 5, 1909. Serial No. 481,474.

To all whom it may concern:

Be it known that I, CARL SIGFRID NYBERG, a subject of the King of Sweden, and resident of Mariedal, Södertelje, in the Kingdom of Sweden, engineer, have invented certain new and useful Improvements in Packaging-Machines, of which the following is a specification, reference being made to the accompanying drawings.

10 The present invention relates to a packaging machine intended chiefly for packaging match-boxes but which can also be employed for the packaging of other goods.

The machine is characterized by two cheeks rotatably mounted and movable in the directions to and from each other, between which cheeks the number of boxes intended for a packet is introduced, and by which these boxes are rotated, during which rotation the wrapping-paper is wrapped around said boxes. After this has been done and the cheeks have stopped their rotation, a support adjusts itself under the packet against which the packet is firmly held by a press-roll resting on the upper end of the wrapping-paper and which acts on the top of the said packet, whereby the cheeks can be so far moved apart that they come outside the side-edges of the wrapping-paper. After this, the first folding-down of the wrapper at the ends of the packet, against which ends the cheeks previously acted, is made by means of a couple of plates which, as soon as they have come down far enough, hold the packet firmly between themselves and remove the same to another place in the machine, where the wrapper at each end of the packet is folded in from the sides and from underneath.

40 A machine constructed in accordance with this invention is shown in the accompanying drawings, wherein—

Figure 1, is a side elevational view of the machine; Fig. 2, is an end elevational view thereof, and Fig. 3 is a plan.

45 In Figs. 1 and 2 are shown the two cheeks 1 and between them a number of match-boxes in the form of a packet 2, which lies about in the middle of the machine. As, however, the devices existing on one side of the middle for the purpose of acting on the one cheek resemble, or are analogous with, the devices existing for the same purpose on the other side of the middle only those existing on the one side are described and shown.

In order to put each cheek into the movement desired, the axle 3 of the same is placed in connection with the continuously rotating driving-axle 4 of the machine by means of a suitable gearing consisting preferably of cog-wheels 5, 6, 7, 8 and 9, of which the wheel 5 is arranged on the driving axle, and the wheels 6 and 7 on intermediate axles 10 and 11 which are journaled in the same bearings 12 which support the axle 3. The pinion 9 on the axle 3 is provided on the whole of its circumference with teeth but the wheel 8 which engages in the same has only a part of its circumference toothed, and this part is provided with so many teeth as correspond to the number of teeth on the pinion in order that this latter may be turned around once while the teeth on the wheel 8 are engaged in the same. After the pinion has completed a revolution and consequently, the cheek 1, has also been rotated once, rotation of the latter is temporarily stopped by a cam 13 attached to the axle 11 at one side of the wheel 8, said cam having a sector-shaped cam-surface, corresponding to that part of the circumference of the wheel 8 which is not toothed, and intended to enter into a corresponding recess 14 in a disk 15 arranged on one side of the pinion, by which means the axle 3 is prevented from rotating, while the axle 11 completes that part of a revolution which corresponds to the un-toothed part of the circumference of the wheel 8.

The second or rectilinear movement of the cheek 1 is brought about by a displacement of the axle 3 on which, for this purpose, there is attached a collar 16 with a groove 17 all around it into which enter the prongs of a fork 18, attached to a rod 19 which is displacably arranged in the bearings 12. The fork 18 is provided with a projection with a roller 20 which enters into the groove 21 in a drum 22 attached to the axle 11. The groove 21 has such a shape and such a position that the axle 3 with the cheek 1 is displaced forward and backward during that period when the cheek does not rotate. The pinion 9 and the disk 15 are evidently so arranged on the axle 3 that, at the displacement of the latter, they are not moved out of their place and, besides, cannot be rotated on the axle.

The matchboxes which are to be packaged are, by means of a device which does not

belong to this invention, fed to a place which is situated immediately under the opening between the cheeks 1 into a special part 23 which, in section, is preferably angular and is carried by an arm 24 attached to a rotatably journaled axle 25, by means of which the part 23 can be raised from its lower position to the opening between the cheeks 1 and there place that number of boxes which are to form a packet. As soon as the boxes have come into this position the cheeks approach each other so much that all the boxes are held securely between them, after which the part 23 immediately descends to its lower position in order to receive the boxes which are required for the next packet. In order that that end surface of each cheek which lies against the boxes may be in a certain degree yielding, so that even hard packed boxes, which are thicker than those not packed so hard, can be held fast without injuring the matches, the end of each cheek consists of a plate 26 which is attached to pins 27 acted upon by springs 28 which press the plate outward. While the boxes are being held fast between the cheeks, then (by means of an arrangement described below) from a magazine 29 for wrapping-paper, the top sheet or leaf is carried forward therefrom so far above the cheeks that the front edge of the sheet at each side of the same comes into a clamp arranged on each cheek, which clamp consists of an arm 30 attached to a pin 31 which extends below the under side of the cheek and which is acted upon by a spring 32 which tends to draw down the arm into a recess in the cheek. When the paper is fed onward to the cheeks each clamp is open, because the free end of a lever 33 which is acted upon by a cam 34 on the axle 11, lies against the lower end of the pin 31 and lifts the same. After the paper has come into the clamps, it is clamped fast by the lever 33 descending and the springs 32 drawing down the arms 30 after which, the cheeks, as has been stated above, are rotated once. When this is being done the paper is held close to the packet by means of a presser device, for example, a roller 35 carried by arms 36 arranged on an axle 37, and with the help of an arm 38 acted on by a cam 39.

When the revolution mentioned above is completed and the cheeks have stopped the roller 35 then resting against the end of the wrapper and pressing the same against the packet, there comes forward against the underside of the packet a supporting plate 40 arranged on the end of an arm 41 which is attached to an axle 42 and which, with the help of an arm 43 is acted on by a cam 44. The plate 40 against which the packet is pressed by the roller 35, serves to support the said packet when the cheeks, after the rotation is ended, are withdrawn in the longitudinal direction of the axles 3 away from

the packet, in order that the first folding down of the wrapper at the ends of the packet may be brought about. In order that the displacement of the cheeks may take place without the wrapper being injured by the clamps these are opened a little on this occasion by the aid of the levers 33 and the cams 34 so that the paper can glide out of said clamps and then the cheeks are displaced so far that those surfaces of the plates 26 which are turned toward the packet come outside the edges of the wrapper. It is clear that during this displacement of the cheeks the clamps must be open until the ends of the arms 30 have come outside the edges of the paper, and for this reason the surface of each of the arms 33 against which the lower end of the pin 31 lies, is so broad that the clamp is kept open for a sufficient length of time during the displacement of the cheeks.

The first folding-down of the wrapper at the ends of the packet is done with the help of two folding plates 45 which, when the folding shall take place are situated above the packet, one at each of its ends, and each of which plates is attached to one end of a rod 46 which is displaceably arranged in a sleeve 47 rotatably suspended and which rod at the other end is articulated to a lever 48. This lever is acted on by a grooved drum 49 mounted on an axle 50 which, by means of a conical gearing 51, 52, receives its motion from the driving-axle 4. On the axle 50 there is mounted a cam 53 against which rests a roller 54 on a cross-piece 55 which connects two rods 56 which are displaceably arranged each on one side of the magazine 29, and which above are connected by means of a cross-piece 57 on which the sleeves 47 are rotatably suspended. The folding plates 45 and the rods 46 receive, as will be understood from the above, partly an up and down movement from the cam 53 and partly a movement in the longitudinal direction of the rods from the grooved drum 49. The downward directed movement takes place as soon as those ends of the cheeks which are turned toward the packet have come outside the edges of the wrapper, the plates 45 then folding down the wrapper against the ends of the packet which while this is being done is pressed against the supporting plate 40 by the roller 35. When the folding plates 45 descend to their lowest position the packet will be held fast between them, as the distance between the plates when they are in a raised position is somewhat less than the distance between the ends of the packet, and as, besides, the plates are attached to the free ends of the comparatively long rods 46 whereby a certain elasticity in these latter can be utilized, so that the packet is held fast by the plates when these have descended to their lowest position. Immediately hereafter the pressure

29, the paste-holder 60 at once descends in order to lift up the next paper so that this latter will be lifted so early that the clamp jaw 66 will be sure to come underneath it during the return movement of the rods 46 and 67.

The paper pile in the magazine 29 rests on a platform 71 which is movable up and down in said magazine and which is supported by two upright rods 72, which are guided below, and which are acted upon by some device, for example, ropes passing over pulleys and with weights fastened to them, so that the platform 71 and the paper laid upon it thereby will be moved upward. In order that this tendency to move the paper upward shall not exist when the paste-holder 60 is held lifted from the top sheet, there is arranged between the rods 72 a wedge-formed brake-plate 73, which is connected with a lever 74 and which, by means of a spring 75 connected with said lever, is kept pressed in between the rods 72 so that these cannot be displaced. On the lever 74 there is a roller 76 against which acts a cam 77 attached to the axle 50, which cam, when the holder 60 is lowered toward the top sheet, strikes the brake-plate 73 out of contact with the rods 72, so that the device which acts upon them can lift the paper pile which hereby is pressed between the platform 71 and the holder 60. The paper can also be hindered from being lifted over the upper edge of the magazine by the small projections or teeth arranged on said edge and turned inward, which teeth, however, must not prevent the top sheet from being lifted by the paste-holder.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the character described, the combination with a pair of intermittently revoluble and axially reciprocable cheek plates for holding articles to be wrapped, of means for revolving said cheek plates intermittently and means for moving the same axially, means whereby said cheek plates yield under pressure and are returned to initial position after removal of pressure, and means carried by said cheek plates for releasably retaining a wrapper blank, substantially as described.

2. In a machine of the character described, the combination with a pair of cheek plates for holding articles to be wrapped, of means for intermittently revolving said plates to envelop the articles held thereby in a wrapper blank, an article supporting plate and means for moving the same into position to support the articles after they have been partly enveloped and while the plates are stationary, substantially as described.

3. In a machine of the character described, the combination with a pair of cheek plates

for holding articles to be wrapped, of means for intermittently rotating said plates to envelop the articles held thereby in a wrapper blank, an article supporting plate, means for moving the same into position to support the articles, and means for axially reciprocating the cheek plates while the articles are being supported by the supporting plate, substantially as described.

4. In a machine of the character described, the combination with a pair of cheek plates, of means carried thereby for releasably retaining a wrapper blank, means whereby said cheek plates yield under pressure and are returned to initial position after removal of pressure, means for revolving the plates to envelop the articles held thereby in a wrapper blank, means for reciprocating said cheek plates axially, and means operating, during the axial movement of the cheek plates, to release the wrapper blank from its retaining means, substantially as described.

5. In a machine of the character described, the combination with a pair of yielding cheek plates for holding articles to be wrapped, of means carried thereby for releasably retaining a wrapper blank, means for revolving the cheek plates to envelop the articles held thereby in a wrapper blank, an article supporting plate, means for moving the supporting plate under the articles while they are stationary, means exerting pressure upon the articles to retain the same upon the supporting plate, and means for moving the cheek plates axially to release them from the articles, substantially as described.

6. In a machine of the character described, the combination with a pair of cheek plates for holding articles to be wrapped, of means carried thereby for releasably retaining a wrapper blank, means for revolving the cheek plates and articles to envelop the latter in a wrapper blank, and means operating vertically to fold down the ends of the wrapper blank and thereafter operating horizontally to convey the articles outside the machine, substantially as described.

7. In a machine of the character described, the combination with a pair of cheek plates for holding articles to be wrapped, of means carried thereby for releasably retaining a wrapper blank, means for revolving the cheek plates and articles to envelop the latter in a wrapper blank, a supporting plate designed to be moved into contact with the articles while they are stationary, and means for folding down the ends of the wrapper blank and for conveying the partially completed package outside the machine, substantially as described.

8. In a machine of the character described, the combination with a pair of cheek plates for holding articles to be wrapped, of means

of the roller 35 against the packet ceases and the rods 46 are displaced to the right (see Fig. 1) and in doing so they bring with themselves the packet held fast between them, in order to afterward place said packet on a table or other support 58. During this movement to the right, the rods 46 are acted on by the cam 53 so that the packet with respect to its position vertically comes into its place on the table, and as soon as this has taken place, there comes against the upper side of the packet a roller, or the like, 59 which retains the packet against the table whereupon the folding plates directly afterward rise in order to be carried by the grooved drum 49 and the lever 48 back to the position, shown in Fig. 1, above the cheeks 1. The completion of the folding of a packet which has been moved to the table 58 under the roller 59 is attained by a device which does not form part of this invention.

While the folding plates 45 descend against, and hold fast a packet, thereafter move this and then return to their original position, the boxes intended for the next packet are placed in position between the cheeks, and the topmost sheet in the magazine 29 is removed therefrom to the cheeks. In order that it may be possible for the boxes to be raised into their position, the supporting-plate 40 is brought back toward the axle 11 and lies against it when the boxes are raised by the part 23, which takes place as soon as the packet between the plates 45 has been carried by these a sufficiently great distance from the cheeks. The boxes are thereafter pressed firmly between the cheeks and the part 23 descends, as described above. To remove the top sheet from the magazine 29 to the cheeks, the following devices operate. After a packet has been moved to the table 58 by the folding plates 45, a paste-holder 60, which is movable in an up and down direction, and is arranged above that side of the paper-magazine 29 turned toward the cheeks and in the bottom of which holder there are openings for the pressing out of the paste on its under-side, descends toward the topmost sheet after which the holder 60 once more ascends and in doing so lifts that part of the sheet on which the paste has been put as well as the adjacent part of same sheet. The holder 60 is carried by rods 61 which are displaceably arranged one on each side of the paper-magazine 29 and which below are connected by means of a cross-piece 62 with a roller 63 which lies against a cam 64 arranged on the axle 50 by which cam the holder 60 is vertically reciprocated.

The above mentioned lifting of the top sheet can be facilitated by arranging by the side of the holder an air-chamber 65 which is in connection with a suction appa-

ratus and in whose bottom, which is on a level with the bottom of the holder, there are arranged suitable openings so that at the upward movement of the holder the paper will be lifted by the aid of the suction device too. That edge of the paper which is turned toward the cheeks is lifted so early that it is in a lifted position for such a length of time before the folding plates have returned to their position above the cheeks that a clamp jaw 66, situated under each rod 46 and taking part in the longitudinal movement of the same and which is turned in toward the magazine, has the opportunity to enter under the lifted paper during the return movement of the plates. Each clamp-jaw 66 extends from the one end of a rod 67 the other end of which is connected with that part which supports the end of the rod 46 and is acted on by the lever 48. The rod 67, which is drawn by a spring 68 in the direction toward the rod 46, is prevented by a roller 69 connected with the magazine 29 from being lifted by the spring 68 more than to a certain height, so that the clamp-jaw 66 may be sure of coming in under the lifted paper. When the plates 45, thereafter are moved down by the rods 46 and fold down the wrapper at the ends of the packet, a clamp-jaw 70 arranged on each rod 46 descends toward the clamp-jaw 66, whereby the paper is clamped between them and is then pressed down somewhat, so that it is carried away from the underside of the holder 60 and thus, too, from the air-chamber 65 in which the suction has now ceased. The clamping of the paper between the jaws 66 and 70 thus takes place simultaneously with the folding down of the wrapper at the ends of the packet, and it is plain that when the packet is thereafter moved away, which is brought about by the displacement of the rods 46, the paper which is clamped between the jaws will be drawn out of the magazine in the direction toward the cheeks 1 between which, during that time which is required for the removal of a packet from its position between the cheeks to the table 58, the boxes for the next packet have come and have been pressed between the cheeks, and the clamps of these latter have been opened to receive and immediately catch the edges of that paper which has just been carried forward to them. When the plates 45 are thereupon lifted from the packet which has been moved to the table 58, the jaw 70 is lifted from the jaw 66 so that these, on their return movement, cannot disturb that paper which is now retained by the cheeks and which, during the return movement mentioned, is wrapped around the boxes which have last been placed between the cheeks. As soon as a paper has been completely drawn out of the magazine

for placing a wrapper blank about said articles, a pair of folding plates to fold the end flaps of said wrapper blank against the articles, and means for moving said folding plates vertically to fold the flap and thereafter to move the same horizontally, whereby the plates convey the partially completed package outside the machine, substantially as described.

9. In a machine of the character described, the combination with a pair of cheek plates for holding articles to be wrapped, of means for placing a wrapper blank about said articles, a supporting plate movable into a position under the articles to support the same while the articles are stationary, means to move the cheek plates axially away from the articles, a pair of folding plates, and means to move the folding plates vertically to fold the end flaps of the wrapper and horizontally to convey the partially completed package outside the machine, substantially as described.

10. In a machine of the character described, the combination with a pair of cheeks for holding articles to be wrapped, of means carried thereby for releasably retaining a wrapper blank, means whereby said cheeks yield under pressure and are returned to initial position after removal of pressure, a support for a pile of wrapper blanks, means for feeding wrappers singly to said retaining means, means for revolving said cheeks to envelop the articles held thereby in a wrapper blank, means for operating said wrapper retaining means to release the wrapper blanks, and means for moving said cheeks axially away from the

articles held thereby, substantially as described.

11. In a machine of the character described, the combination with a continuously rotating driving shaft, of a pair of cheek plates for holding articles therebetween, means whereby said cheek plates yield under pressure and are returned to initial position after removal of pressure, a shaft on which said cheek plates are fixed, said shaft being driven from the driving shaft and means for temporarily stopping revolution of said cheek-plate-shaft, said means comprising a recessed disk on the cheek-plate-shaft and a cam having a sector-shaped cam-surface adapted to enter the recess in the disk, substantially as described.

12. In a machine of the character described, the combination with a continuously rotating driving shaft, of a cheek-plate-shaft driven therefrom, cheek plates fixed to said last named shaft, means whereby said cheek plates yield under pressure and are returned to initial position after removal of pressure, means for temporarily stopping rotation of said cheek plates and means for imparting a reciprocatory movement to said cheek plates, said last named means comprising a grooved collar and a roller adapted to travel in said collar to actuate the cheek-plate-shaft, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CARL SIGFRID NYBERG.

Witnesses:

CARL TH. SUNDHOLM,
H. B. OHLSSON.